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HEALTH CARE IN CENTRAL ASIA

TECHNICAL REPORT:
Allocating Funding to the Health Sector: A Review of International Experience

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I. Acknowledgements

II. Abstract

Allocating the appropriate amount of funding to the health sector in Central Asia remains an ongoing international debate and determining the appropriate level depends upon several factors, including availability of local resources and the value a society places on health relative to other priorities. Based on our research, it can be said that public health spending in Central Asia falls below international standards. In this report, formulas were created to determine available levels of funding and costs/wages were compared relative to those found elsewhere in the world. The result is that under the current system, out-of-pocket payments will be unavoidable unless Central Asian countries shrink the system and devote a larger percentage of public funds to the health care sector.

III. Executive Summary

Determining the "right" level of funding allocated to the health sector has been raised often in the international health care reform debate. No particular formula has emerged to guide allocation of funding to the health sector, and it is recognized that the appropriate level of funding depends on the resources available and the value a society gives to health and health care relative to other priorities. Nonetheless, when examining international patterns of funding for the health sector, it appears that there may be a minimum threshold of public funding as a percentage of gross domestic product (GDP) beneath which out-of-pocket payments will grow to fill the gap. Public health spending in the Central Asian republics falls well below this threshold.

Furthermore, the size of the labor force and the infrastructure of the health care delivery system inherited from the former Soviet Union that must be supported by this low level of public health expenditure are much larger in the Central Asian republics than in other countries of similar, and even much higher, income levels. The mismatch between the size of the health sector labor force and the level of public expenditures on health is made clear by the amount of health spending per physician in the Central Asian republics. International patterns of health spending per physician show that even at low levels of national income, total expenditure per physician typically does not fall below $200,000 per year, whereas Kazakhstan, Kyrgyzstan and Uzbekistan all spend less than $70,000 per doctor per year.

A simple model of health care expenditures and inputs used to produce health care services, or a health care production function, is developed to carry out simulations of different mixes of health care inputs that are possible at different levels of funding, and the level of funding necessary to support different levels and mixes of inputs. The model is used to demonstrate the level of health care expenditures needed in the Central Asian republics to bring the health care systems closer to international standards. The model shows, for example, that if the current infrastructure and staffing levels are maintained while increasing physician salaries and drug expenditures in Kazakhstan, 6.9 percent of GDP would have to be allocated to health care, which is a substantial increase over the current level of public expenditure on health of 2.7 percent of GDP.

The experience in this review suggests that post-Soviet economies will not be able to maintain the extensive health care system with such low levels of public health expenditure and simultaneously avoid the high levels of out-of-pocket payments currently observed. Furthermore, the limited expenditure is spread over a large number of physicians, reducing their compensation relative to peers in other countries with similar income levels, and limiting the medicines, supplies and other inputs physicians need to provide good quality care. If economic barriers to care are to be lowered, quality improved, and equity maintained, then the countries must shrink the system or devote a larger percentage of public funds to health care, or do both.

IV. Introduction

Determining the "right" level of funding allocated to the health sector has been raised often in the international health care reform debate.[1] No particular guidelines or formulas have emerged to guide allocation of funding to the health sector, and it is recognized that the appropriate level of funding depends on the resources available and the value a society gives to health and health care relative to other priorities. Nonetheless, when examining international trends in funding for the health sector, some patterns are evident and national health spending in the Central Asian republics currently diverge sharply from these international patterns.

At the request of the USAID-funded Abt Associates ZdravPlus Project (ZdravPlus), Boston University School of Public Heath prepared the following analysis of health funding in developed and newly industrializing economies around the world. This review is intended to inform the difficult debate now ongoing in the countries of Central Asia to determine the amount of public funding that should be made available to the health care system. We examine health spending patterns across a range of countries and, using available statistics, we explore the relationship between levels of funding, national economic development, the extent of investment (personnel and facilities) in the health system, and health outcomes. We develop a model of key inputs into the health care system and estimate the amount of funding that might be required if Central Asian countries keep current levels of staffing and facilities but pay wages and input costs, relative to the rest of the economy, that are observed elsewhere in the world. Finally, we look at the process by which developed nations determine available levels of health care funding.

The experience in this review suggests that the Central Asian republics will not be able to maintain the extensive Soviet health care system at the current low levels of public health expenditure and simultaneously avoid the high levels of out-of-pocket payments currently observed. Furthermore, the limited expenditure is spread over a large number of physicians, reducing their compensation relative to peers in other countries with similar income levels, and limiting the medicines, supplies and other inputs physicians need to provide good quality care. If economic barriers to care are to be lowered, quality improved, and equity maintained, then countries must shrink the system or devote a larger percentage of public funds to health care, or do both.

V. Background: The Post-Soviet Context

A. Health Services Labor Force and Infrastructure

The Soviet health care system developed an extensive nationwide network of facilities and a very high level of physician staffing relative to the population. The high staffing levels persist in the countries of Central Asia, where the development was only slightly less intensive than in the Russian heartland and the Caucuses. Today, Kazakhstan has 353 doctors per 100,000 population, Uzbekistan has 309, and Kyrgyzstan has 301. Russia has somewhat more physicians per population at 421/100,000. In comparison, in the large countries of Western Europe, only Spain (424/100,000) and Italy (550/100,000) have significantly more doctors per population than the Central Asian republics. Germany (350/100,000) and France (300/100,000) have similar physician-to-population ratios, while the United Kingdom has significantly less (160/100,000).[2]

The Soviet government also invested heavily in hospitals. Separate hospital systems were built for children, adults, and reproductive health services, as well as for specific disease categories, such as tuberculosis, oncology, and sexually transmitted infections. In addition, the national government created centers for highly specialized care, such as cardiology or endocrinology, and separate emergency hospitals. The Soviet health care system also extended throughout the rural areas, with an extensive network of ambulatories staffed by physicians (known by the Russian acronym SVA), and in more remote areas

health posts (known by the Russian acronym FAP) staffed by physician assistants and midwives. There were also many small rural hospitals to serve the widely dispersed population outside the cities.

As Roemer observed, a built bed is a filled bed. [3] Soviet budgeting techniques allocated funds according to capacity (beds) and activity (number of patient days), thus encouraging long hospital stays and hospitalizations that were medically unwarranted, such as for cases that could be treated in an outpatient setting, and to serve "socially needy" cases that lacked access to home care or long-term care facilities. Norms of care (Medical Economic Standards) reinforced the excess use of hospital care made possible by the large supply of hospital beds. Norms specified exact periods of hospitalization for each type of medical problem, for example, ten days for childbirth, appendectomy, or gallbladder surgery; two weeks for a hysterectomy; and eight weeks for a heart attack.[4] These prescribed "recovery" periods were strictly adhered to, even when the patient clearly no longer needed further hospital care. In the early 1980s, one-quarter of the population was hospitalized each year. The average hospital stay was 15 days, whereas the average hospital stay at that time in the United States was only five days.

The Soviet government appeared to be able to operate this extensive health care system at relatively low levels of expenditure relative to the gross domestic product (GDP). Under the "residual funding" principle, health care received budget funds after sectors deemed more important, such as defense, agriculture and heavy industry were financed. Furthermore, the low levels of budget funds were not supplemented significantly by out-of-pocket payments by patients, which were apparently low. The cost to patients was not generally considered to be a barrier to accessing health care. Low levels of budget funding combined with low out-of-pocket payments resulted in health spending that was only about four percent of GDP in the USSR in the mid-1980s.[5] In 1986 the United States spent 11.1 percent of GDP on health, West Germany spent 8.1 percent, and Britain spent 6.2 percent.

There were a number of unique aspects of the Soviet command economy that permitted this high level of staffing and facilities in a health care system to be funded at such low levels. Inputs into health care such as medicines and utilities were highly subsidized, often implicitly, which limited the cash expenditure required to fund the system. In addition, salaries paid to doctors were low compared to most other countries, often less than the salary paid to skilled workers lacking advanced education. There were few consumer goods available, however, and many basic necessities – such as housing and food – were subsidized, and higher education was generally free. Thus, doctors were able to maintain a standard of living comparable to their neighbors, and the demand for additional consumer goods was constrained by the lack of supply.

Patients were required to pay for one significant component of their health care–outpatient drugs. Drug costs were covered by the government only for certain socially protected groups, such as veterans and pensioners, and for certain disease categories, such as diabetes and tuberculosis. The range of drugs available was limited, and typically availability was identified as more of a barrier to access to drugs than the cost of drugs. No profit incentive drove pharmaceutical companies to invest in marketing measures that encourage doctors to prescribe more expensive drugs. In effect, there was a limited formulary available at controlled prices, set so that drugs were affordable to patients with modest incomes.

B. Collapse of Public Funding

With the collapse of the Soviet Union, public funds could no longer support the health care system as it had been supported in the past, and the network of implicit subsidies fell apart. Out-of-pocket expenditures began to fill the void left by declining government contributions. The factors leading to this shift were the following:

- Public sector revenues fell as economies contracted and a large portion of the new "market" economy developed beyond the reach of traditional tax mechanisms.

- With falling tax revenues, governments were forced to choose between health and other priorities for the little revenue available. Even if health retained its share of public finance, the real value of public health spending declined.

- Sectors of the economy, such as heat, electricity and other utilities, were deregulated and the implicit subsidy system was discontinued. Therefore, health facilities began to face the full cost of operating their over-sized physical structures.

- Prices were liberalized and rose as market economies developed. Subsidies on consumer goods and housing were reduced or terminated, so the health care workers had to pay more for basic necessities, such as food, clothing, and housing. Public sector salaries did not keep up with price increases, so the purchasing power of the salary of a doctor or nurse fell dramatically. Furthermore, salary arrears became commonplace, as budget funds persistently fell short of commitments, and health staff often went without salary for extended periods.

- Consumer goods began to appear on the market, and citizens employed in the prosperous parts of the private sector were able to purchase these goods, whereas health care workers were not. Doctors, often better educated than their prospering private sector peers, wanted these goods too, but they could not afford them on public sector salaries.

- International drug companies moved into the developing market, and drug prices rose to world market levels or beyond. Outpatient drugs, once affordable for all, moved out of the reach of many. Funds were sometimes inadequate to maintain the drug subsidy program for protected groups. Forced to choose between paying salaries and buying drugs, hospitals failed to buy the necessary drugs and surgical supplies. It became the patients' responsibility to contribute medicines and supplies to their care. In Russia, 50 percent of households surveyed said that, at least once in 1998, a family member did not purchase a recommended drug because of its cost. The percentage unable to buy a recommended drug increased to 64 percent when children and elders (supposedly protected groups) were present in the household. [6]

Data on public expenditure confirms the decline in public contributions to the health care system. In Uzbekistan, government expenditures on health as a proportion of GDP fell from 4.6 percent in 1990 to 3.3 percent in 1998. In Kyrgyzstan, government health spending fell from 4.1 percent of GDP in 1991 to 2.7 percent in 1999, with another 0.1 percent flowing from mandatory health insurance (MHI). Kazakhstan got a little more from its short-lived mandatory health insurance program; 0.5 percent of GDP in 1998; however, total public spending on health (including MHI) fell from 4.2 percent of GDP in 1991 to 1.9 percent in 1998. In the best case, in Uzbekistan, the proportion of GDP committed to the health sector by public sources fell by a third over the decade. In the worst case, in Kazakhstan, the proportion of the GDP allocated to health care fell by half.[7] At the same time, national economies were shrinking, so the real decline in public sector funding was even greater. In Kazakhstan by 1998, real public health spending was only 32 percent of the 1991 level.

The decline in public funding for the health sector throughout the former Soviet Union has been accompanied by a sharp increase in out-of-pocket payments by patients. Work by Maureen Lewis of the World Bank pulls together a variety of household surveys from across the former Soviet Union and confirms that the increasing reliance on out-of-pocket expenditures has also occurred in Central Asia. Household surveys show that 75 percent of Kyrgyz households and 66 percent of Tajik households reported making informal payments for medical care.[8] Because outpatient drugs were always purchased by most Soviet citizens, purchases from community pharmacies are not included in this data on informal payments.

This dramatic decline in public funding of the health care system, accompanied by rising levels of out-of-pocket spending and increased economic barriers to care, raises the question: how much should a government (or social insurance mechanism) spend on health care? There is no prior experience with

transition from command-and-control economies, such as those in Central Asia, to the operation of a health care system in a market economy. Thus, there is no single country that can be used as a model to guide the appropriate level of health care spending through the transition. But we can learn much by studying health expenditure patterns in other countries. The experience outlined below suggests that post-Soviet economies will not be able to maintain the extensive Soviet health care system with such small levels of public health expenditure and simultaneously avoid the high levels of out-of-pocket expense currently observed.

VI. Patterns in National Spending for Health Care

Where do health spending patterns in the Central Asian Republics fit in the worldwide pattern of health care spending? This is not an easy question to answer, because there are no comparable countries. Table 1 shows a number of economic and social indicators for Kazakhstan, Kyrgyzstan and Uzbekistan; for the newly industrializing countries of Turkey, Mexico, Brazil, China and Thailand; and for five countries of Western Europe – United Kingdom, Germany, France, Denmark and Spain. Also included is Japan, as well as Poland and Russia. Per capita GDP, valued in terms of purchasing power parity, in the Central Asian countries is between 10 and 25 percent of the $25,000 level observed in Western Europe and Japan. Of the countries listed, only China has a per capita income lower than Kazakhstan; and Kyrgyzstan and Uzbekistan are poorer than any of the listed countries.

Yet, in other respects, the Central Asian countries are more advanced than some of the more prosperous industrializing nations. The wealthy countries have literacy rates of 99 percent, with Spain slightly lower at 98 percent. The broad reach of the Soviet education system is shown by the 97 percent, 98 percent and 99 percent literacy rates in Kyrgyzstan, Kazakhstan and Uzbekistan, respectively, which is very close to literacy rates of Western Europe and Japan. The other former socialist economies—Russia and Poland—actually exceed Western European literacy rates. Literacy rates in Turkey, Brazil and China do not exceed 85 percent. Only Thailand exceeds 95 percent literacy. The Central Asian countries have less wealthy economies, but they have a more highly educated population than the middle rank of industrializing economies.

Table 1:   Selected Economic and Social Indicators

Country	Per capita GDP ($PPP)	% population over 65	Life expectancy	Infant mortality	% Adult literacy rate
Denmark	27,627	14.9	76.4	4.2	99
Japan	26,755	17.0	80.7	3.2	99
Germany	25,103	16.2	77.0	4.4	99
France	24,223	16.0	78.9	4.4	99
UK	23,509	15.7	77.3	5.6	99
Spain	19,472	16.9	78.2	3.9	97.6
Poland	9,051	12.3	73.3	8.1	99.7
Mexico	9,023	4.3	73.0	25.0	91.4
Russia	8,377	12.6	65.3	15.8	99.6
Brazil	7,625	5.3	68.1	32.0	85.2
Turkey	6,974	6.0	69.7	36.0	85.1
Thailand	6,402	6.4	68.8	25.0	95.5
Kazakhstan	5,871	7.1	65.5	76.0	98
China	3,976	7.0	70.3	32.0	84.1
Kyrgyzstan	2,711	5.0	66.4	57.0	97
Uzbekistan	2,411	4.6	69.7	56.0	99.2

GDP, life expectancy and infant mortality rate from World Bank Development Indicators (2000); adult literacy rates from UNESCO (2000)

An aging population needs more health care, as chronic diseases develop and worsen with age. The demographic profile of the Central Asian republics places them closer to the newly industrializing countries than Japan or the countries of Europe, including Russia and Poland. In the developed economies, 15 percent or more of the population is over 65, with about 12.5 percent over 65 in Russia and Poland. Of the Central Asian republics, Kazakhstan, at seven percent over 65, is the "oldest" and Uzbekistan, with its higher fertility rate, the youngest at 4.6 percent of the population over 65. This is very similar to the newly industrializing countries, which range from four to seven percent over 65. To the extent that the demographic profile drives health care need, the Central Asian republics are similar to countries like Thailand and Brazil.

In terms of health outcomes, life expectancy at birth is 65.5 years, 66.4 years, and 69.7 years in Kazakhstan, Kyrgyzstan, and Uzbekistan, respectively. This is similar to life expectancies observed in the middle-income countries of Russia, Brazil, Turkey and Thailand, but below the life expectancy achieved in the higher-income countries. Infant mortality rates (IMR) are significantly higher in the Central Asian republics than in other countries of similar income levels, such as Turkey, Thailand and China.

Table 2 shows an international comparison of the investment in the health care system. The main indicator used to summarize total investment in the health sector is the percentage of GDP spent on health, both total and disaggregated by public and private expenditures.

Table 2:   International Comparison of Investment in the Health Sector (2000)

Country	% of GDP spent on health	Public spending as % of total health spending	Public health spending as a % of GDP	Private spending as % of total health spending	Private health spending as a % of GDP
Denmark	8.3	82.1	6.8	17.9	1.5
Japan	7.8	76.7	6.0	23.3	1.8
Germany	10.6	75.1	8.0	24.9	2.6
France	9.5	76.0	7.2	24.0	2.3
UK	7.3	81.0	5.9	19.0	1.4
Spain	7.7	69.9	5.4	30.1	2.3
Poland	6.0	69.7	4.2	30.3	1.8
Mexico	5.4	46.4	2.5	53.6	2.9
Russia	5.3	72.5	3.8	27.5	1.5
Brazil	8.3	40.8	3.4	59.2	4.9
Turkey	5.0	71.1	3.6	28.9	1.4
Thailand	3.7	57.4	2.1	42.6	1.6
Kazakhstan	3.7	73.2	2.7	26.8	1.0
China	5.3	63.4	3.4	36.6	1.9
Kyrgyzstan	6.0	61.7	3.7	38.3	2.3
Uzbekistan	3.7	77.5	2.9	22.5	0.8

The World Health Report (2002)

As expected, total health spending as a percentage of GDP generally increases as GDP increases, with the lower- to middle-income countries (per capita GDP less than $10,000/person) allocating less than six percent of GDP to health care, whereas the higher income countries all spend more than seven percent. Public health spending as a percentage of GDP also rises as GDP rises, and is above five percent in all of the high-income countries. Public expenditure on health as a percentage of GDP is 2.7 percent, 3.7 percent, and 2.9 percent in Kazakhstan, Kyrgyzstan and Uzbekistan, respectively. Thailand and Mexico are the only other countries reported with public health spending of less than three percent of GDP.

In most of the world, the public sector shoulders a greater proportion of the funding burden as development proceeds and health care becomes more extensive. Schieber and Maeda (1997) analyzed health expenditure data from 202 countries and found that the poorest countries spend the least on health care as a percentage of GDP, and that the public share of health spending, defined as government budget and compulsory insurance schemes, increases as national income increases.[9] In all of the high-income countries above, the public sector share of health spending is over 75 percent. In Spain and Poland the public share is nearly 70 percent. Even in the United States, the public sector pays almost 50 percent of health care costs, while throughout Europe the public percentage exceeds 60 percent..[10,11] The out-of-pocket burden in the United States is not as high as it may seem by looking at public and private expenditure shares. Employer-provided health insurance offers a risk-pooling mechanism that lowers out-of-pocket expense to about a quarter of total health spending.[10] The increase in the share of public/risk-pooled funding as total health spending grows is confirmed in the multi-nation regression reported by Musgrove et al.[11]

The reasons why public funding expands faster than total funding for health care are understandable. As health systems expand and increase their offering of services, the cost of many services exceeds what the sick individual who needs these services can pay. Without public funding or risk-pooling mechanisms, individuals may face out-of-pocket payments that are extremely high, and even impoverishing. Risk-pooling mechanisms are necessary to provide financial risk protection against excessively high out-of-pocket expenditures for health. In addition, private payments alone are not sufficient to support the more extensive and intensive medical care available as the number of doctors and hospital beds expands. Societies that want more health care are forced to institute insurance programs or allocate a larger proportion of tax dollars to health in order to support these services.

In the middle- and lower-income countries, where public funding is below five percent of GDP, private expenditures typically fill the gap to bring total health expenditures above five percent of GDP. The exceptions are Thailand, Kazakhstan and Uzbekistan, where total health expenditure remains below four percent of GDP. In Kyrgyzstan, total health spending was estimated to be 6 percent of GDP.[*] Thus, the Central Asian republics, with the exception of Kyrgyzstan, show lower public health expenditures and lower total health expenditures as proportion of GDP relative to other countries at similar levels of national income. The estimates of out-of-pocket expenditures on health care in Central Asia may be unreliable, however, because most out-of-pocket health expenditures in Central Asia are informal payments, which must be imputed from limited household survey data. It is difficult to get accurate estimates of the proportion of health expenditure that comes from patient's pockets in post-Soviet countries, but some surveys suggest that half or more of total health care spending may now be out of pocket. Kutzin and Cashin use a number of sources to estimate that out-of-pocket health spending in Kyrgyzstan and Kazakhstan now exceeds 30 percent of total health spending.[7] These estimates are similar to those of the World Health Organization reported in Table 2. So, total health expenditures as a percentage of GDP may actually be closer to the 5 percent threshold that is typically observed.

When we begin to look at the extent of the health care system in Central Asia, we see an even greater divergence from the industrializing world. Table 3 shows data on a number of structural components of the health care system, including the supply of hospital beds, doctors, and nurses per population.

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[*] It should be noted that these estimates are high compared to estimates given in other sources. For example, the WHO Health for All database reports expenditure on health as a percentage of GDP to be 1.64%, 2.3%, and 2.6% in Kazakhstan, Kyrgyzstan and Uzbekistan, respectively. Therefore, the analysis presented here should be interpreted as an upper bound for total health expenditures in the Central Asian region.

Table 3:   Health Care Resources and Infrastructure

Country	Hospital beds/1,000 population	Physicians/100,000 population	Nurses/100,000 population
Denmark	4.3 (1999)	290	937
Japan	16.0 (1999)	193	745 (1996)
Germany	9.1 (2000)	350	951
France	8.2 (2000)	303	650
UK	4.0 (1999)	164	497 (1989)
Spain	4.0	424	458
Poland	5.6 (2000)	236	527 (1990)
Mexico	1.0 (1999)	186	87 (1995)
Russia	10.8	421	818
Brazil	3.0 (1996)	127	41 (1996)
Turkey	2.4	121	240
Thailand	2.0 (1995)	24	87 (1995)
Kazakhstan	7.0	353	631
China	2.0	162	99 (1998)
Kyrgyzstan	6.0	301	756
Uzbekistan	5.3	309	1014

Hospital beds/1,000 from WHO Health for All Database (2001); Brazil, China, Japan, Mexico, Thailand and U.K. from World Bank World Development Indicators 2002.

Physicians/100,000 from World Bank World Development Indicators 2002.

Nurses/100,000 from WHO Health for All Database (1999), except where year noted (WHO Statistics).

The Central Asian republics have more hospital beds than the other newly industrialized or middle income countries. Only Russia, which also inherited the same health care system, has more hospital beds per 1,000 population. Russia has both higher national income and a Mandatory Health Insurance program, which yields from 0.5 to 0.7 percent of GDP for health care, perhaps explaining the maintenance of the highest bed to population ratio (10.8 beds/1,000).[12] The Central Asian Republics have between five and seven hospital beds per 1,000 population. This is more than Britain, Denmark or Spain, and comparable to France. Only Germany and Japan, of the developed countries listed, have substantially more hospital beds per population than the Central Asian republics.

The Central Asian republics also have more physicians per population than other countries of a similar income level. Whereas the three Central Asian republics reported here have over 300 physicians per 100,000 population (353, 301, and 309 in Kazakhstan, Kyrgyzstan and Uzbekistan, respectively), Turkey, Mexico, Brazil and China have between 121 to 186 doctors per 100,000 population, and Thailand has only 24. Other countries (not shown) with incomes as low as those in Kyrgyzstan and Uzbekistan have even fewer doctors. Germany, France and Spain have numbers of physicians comparable to those observed in Central Asia, but Japan and the United Kingdom far fewer. Therefore, the Central Asian republics report lower public health expenditures as a percentage of GDP than countries of a similar income level, but this lower expenditure must support a much larger health care labor force and service delivery infrastructure.

VII. Health Expenditure per Physician

Perhaps the best way to appreciate the mismatch between the size of the health care labor force and health sector spending in the Central Asian republics, as well as in all of the former Soviet countries, is to examine the amount of health care spending per physician. To calculate this indicator, we multiply the per capita GDP by the percentage of GDP spent on health care, and then divide by the fraction of a physician

per person (physicians/100,000 divided by 100,000). The results are shown in Table 4 and Figure 1. The expenditure per physician not only embodies the salaries paid to physicians, but also the number and salaries of nurses and support staff working with physicians, and all other resources that physicians have available to care for patients, including drugs, supplies, and equipment.
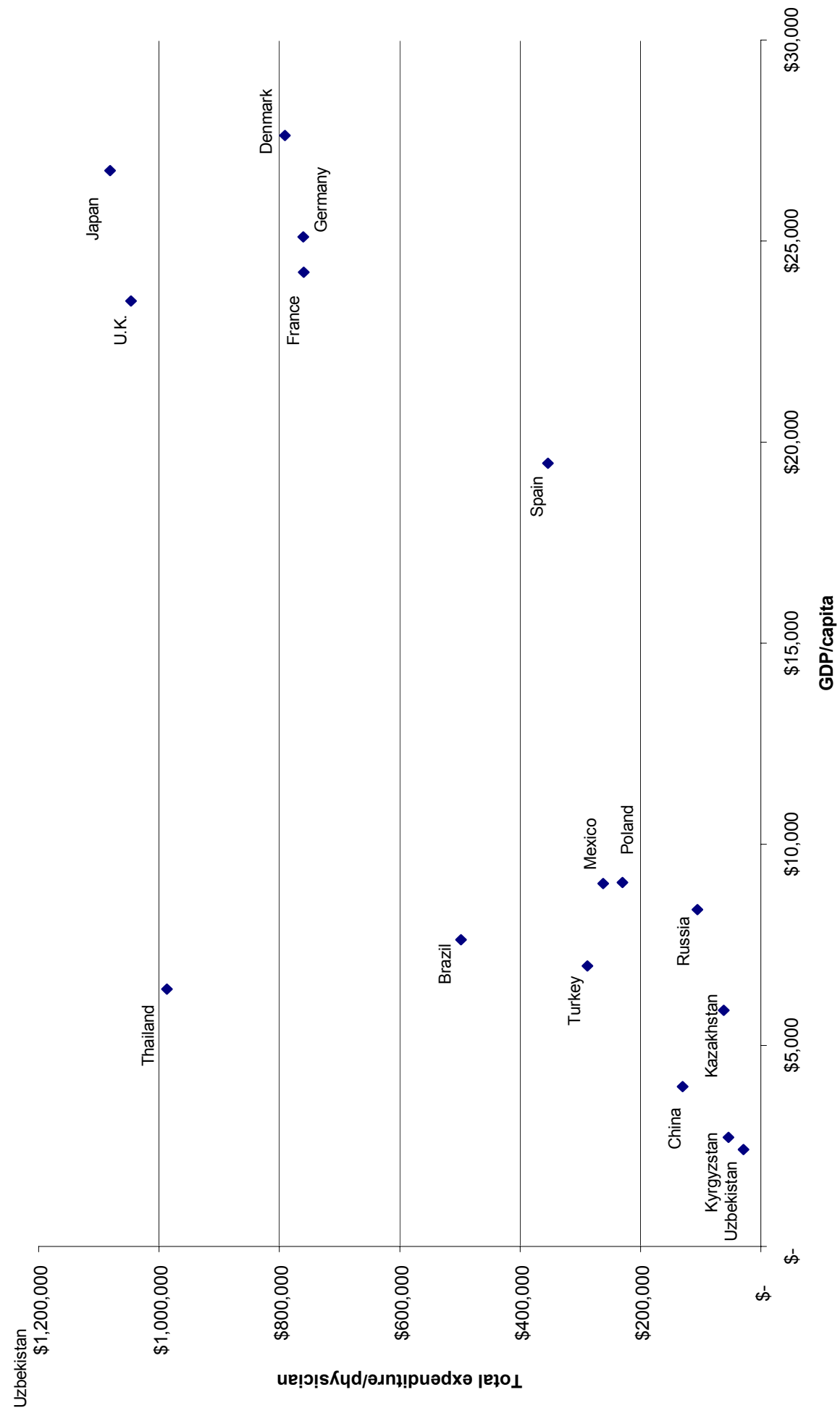
Table 4:   Health Expenditure per Physician

Country	Total expenditure per physician	Public expenditure per physician	Private expenditure per physician
Denmark	$790,704	$649,168	$141,536
Japan	$1,081,290	$829,350	$251,941
Germany	$760,262	$570,957	$189,305
France	$759,467	$577,195	$182,272
U.K.	$1,046,437	$847,614	$198,823
Spain	$353,619	$247,180	$106,439
Poland	$230,110	$160,387	$69,723
Mexico	$261,958	$121,549	$140,410
Russia	$105,459	$76,458	$29,001
Brazil	$498,327	$203,317	$295,009
Turkey	$288,182	$204,897	$83,285
Thailand	$986,975	$566,524	$420,451
Kazakhstan	$61,527	$45,038	$16,038
China	$130,079	$82,470	$47,609
Kyrgyzstan	$54,040	$33,343	$20,697
Uzbekistan	$28,870	$22,374	$6,496

The mean expenditure per physician across all 16 countries reported here is $464,832, with a maximum of $1,081,290 in Japan, and a minimum of $28,870 reported in Uzbekistan. The median expenditure per physician is $204,107. The expenditure per physician for Japan and the United Kingdom are so high, more than twice the average, because these countries have relatively low numbers of physicians. The extraordinarily low number of physicians in Thailand produces the anomalous result seen, and probably implies that a substantial amount of medical care is delivered by nurses and other non-physician professionals. The mean expenditure per physician among low- and middle-income countries,[*] excluding the apparent anomalous case of Thailand, is $184,283, with a maximum of $498,327 in Brazil, and again a minimum of $28,870 in Uzbekistan. Of the countries reviewed, only China and the former Soviet countries of Russia, Kazakhstan, Kyrgyzstan, and Uzbekistan spend less than $200,000 per physician, or less than $100,000 in public funds per physician. China spends more than twice as much per physician as Kazakhstan, Kyrgyzstan and Uzbekistan, which all spend less than $70,000 per doctor per year.

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[*] Low- and middle-income countries are defined here as those with a GDP per capita of less than $10,000: Poland, Mexico, Russia, Brazil, Turkey, Thailand, Kazakhstan, China, Kyrgyzstan, and Uzbekistan.

Figure 1: Relationship between Per Capita GDP and Total Expenditure per Physician

Total expenditure/physician

$1,200,000
$1,000,000
$800,000
$600,000
$400,000
$200,000
$-

Uzbekistan

Japan
Denmark
U.K.
Germany
France
Spain
Thailand
Brazil
Mexico
Poland
Turkey
Russia
Kazakhstan
China
Kyrgyzstan
Uzbekistan

GDP/capita

$- $5,000 $10,000 $15,000 $20,000 $25,000 $30,000

Despite the shortcomings of this measurement, it shows that the amount of resources available to each physician in the Central Asian republics is between 3 and 8 percent of the amount available in the most developed countries, and between 6 (Uzbekistan) and 13 (Kazakhstan) percent of the average, although per capita GDP in the Central Asian countries is between 18 (Uzbekistan) and 45 (Kazakhstan) percent of the average. Government health expenditures per physician are only slightly higher in the Central Asian republics relative to the average, between seven and 14 percent of the average. Kazakhstan, Kyrgyzstan, and Uzbekistan spend 16 percent, 29 percent, and 33 percent of the average in low- and middle-income countries, respectively, although their per capita GDP is between 39 and 64 percent of the average, in terms of purchasing power parity.

International patterns of health spending per physician show that even at low levels of national income, total expenditure per physician typically does not fall below $200,000 per year. This may be considered a threshold of expenditure necessary for physicians to be adequately compensated and have sufficient other inputs at their disposal to provide an acceptable level of care. Of the countries reviewed, only the former Soviet countries of Russia, Kazakhstan, Kyrgyzstan, and Uzbekistan, and China spend less than $200,000 per physician, or less than $100,000 in public funds per physician. China, however, spends more than twice as much per physician as Kazakhstan, Kyrgyzstan and Uzbekistan, which all spend less than $70,000 per doctor per year.

This comparison partially explains why informal payments have grown so rapidly in Central Asia (and other former Soviet countries). The resources that the governments have committed to health care are so far below the amount generally needed to provide a doctor with support staff, drugs and an expected level of compensation that other forms of payment have inevitably grown to meet the need for drugs and salaries. In none of the developed countries shown in Table 3 with more than 200 doctors per 100,000 people did the public portion of health funding fall below 70 percent. According to the various surveys of household health expenditure in former Soviet republics reported in recent years, these countries with as many doctors in relation to population now see public payments falling below two thirds—in some cases below half—of total health spending. Out-of-pocket expenditures in Central Asia are increasing as a result, but nonetheless have not yet brought health expenditures up to five percent of GDP in Kazakhstan and Uzbekistan, nor have they brought expenditure per physician up to the observed $200,000/physician threshold. The effects of informal payments on equity and access to health care are discussed elsewhere in the literature, but it is clear that the countries of the former Soviet Union are "off the curve" when looking at the resources available per physician.

How much of a country's public revenues should be allocated to health care? Musgrove et al. and Schieber and Maeda found that the proportion of public funds allocated to health care increases with national income level. As development proceeds and per capita income rises, the share of public funds going to health increases from 5 percent to 10 percent.[11, 9] The health care system inherited by Central Asian republics is as extensive, or more extensive (measured in terms of beds or staffing), than the systems in the developed countries, all of which spend 10 percent or more of public funds on health.

VIII. A Production Function in Health: Relationships between Elements of Health Expenditure

Providing good medical care requires a mix of staff with different levels of training, plus drugs and supplies and investment in physical facilities and equipment. Doctors will have limited impact on the health of their patients if the system does not employ lab technicians to perform tests or nurses to minister to hospitalized patients. The health system or the patients must be able to purchase drugs, or patients that are diagnosed will go untreated. In economics, the combinations of inputs that produce different goods and services can be represented by a "production function." A production function shows how different quantities of inputs are combined to produce different levels of output, depending on the technology available and the efficiency of the production process. In health care, inputs include labor (physicians, nurses, and all other staff), capital (buildings, beds, diagnostic equipment, and operating

rooms), drugs and supplies. Output can be quantified in terms of the number of services (patient visits, hospital days) or in terms of outcomes (life expectancy, infant mortality rate).

We can represent the health care system in terms of one large production function, shown in a simplified fashion in Equation (1).

$$\text{Quantity (and quality) of health care goods and services} = f\left(L, S, K\right) \qquad (1)$$

Where,

L   =   total health sector wage bill

S   =   total health sector expenditure on medicine and supplies

K   =   total health sector capital expenditure

Output can be produced with varying combinations of inputs of labor, supplies, and capital, with varying input costs, and with different technologies. The amount of inputs used to produce a given quantity of goods and services and the prices of those inputs will determine the cost of production. More efficient combinations of these factors or lower unit prices paid for labor and materials will reduce the cost of producing a given level and quantity of goods and services. We can represent the cost of production of the output of the health sector by its value in terms of its percentage of GDP.

$$\text{Total cost} = .X\,(\text{GDP}) = p_l l + p_s s + p_k k \qquad (2)$$

or

$$\text{Total cost} = .X\,(\text{GDP}) = L + S + K \qquad (3)$$

Where,

Total cost	=	total national health expenditure per year
GDP	=	gross domestic product
X	=	% of GDP allocated to the health sector
p_l	=	price of labor (average health sector wage; payroll taxes)
l	=	quantity of labor (physicians, nurses, ancillary health personnel)
p_s	=	price of medicines and supplies
s	=	quantity of medicines and supplies
p_k	=	price of capital (present discounted value of space and equipment; repairs; utilities)
k	=	quantity of capital
L	=	total health sector wage bill
S	=	total health sector expenditure on medicines and supplies
K	=	total health sector capital expenditure

As shown in Equation (4), the total health sector wage bill can be represented in terms of the size of the population, the number of medical personnel per population, national average salary, and the wages of medical personnel as a proportion of the national average salary.

$$L = \alpha_1 \alpha_2 \left(W\right)\left(N\right) + \alpha_2 \alpha_3 \alpha_4 \left(W\right)\left(N\right) + \alpha_2 \alpha_5 \alpha_6 \left(W\right)\left(N\right) \qquad (4)$$

Where,

W	=	national average salary
N	=	population
α_1	=	wage multiplier for physicians
α_2	=	physicians/population
α_3	=	wage multiplier for ancillary health personnel (nurses, technicians)
α_4	=	ancillary health personnel/physician
α_5	=	wage multiplier for unskilled health care workers
α_6	=	unskilled health care workers/physician

A full production or cost function for the health sector would be very complex. Equations (1) through (4), however, represent a simplified set of functions that can be used to complete simple simulations of different mixes of health care inputs that are possible at different levels of funding, and the level of funding necessary to support different levels and mixes of inputs. The functions embody the following:

1. The number of physicians and the amount they are paid relative to the national average salary. In this formula, the number of physicians is expressed in a physician/population ratio, because this can be compared across countries.

2. The number of paraprofessionals (nurses, technicians) per population and the average amount they are paid relative to the national average. The number of paraprofessionals can be stated as a multiple of the number of physicians. As the number of physicians goes down, this ratio may go up, implying that nurses or physicians assistants assume some of the tasks carried out by doctors in countries with a large number of doctors per patient. In America or the United Kingdom, for example, nurse practitioners may perform some of the functions performed personally by a doctor in a country where physician staffing ratios are higher. When other clinical professionals (pharmacists, laboratory technicians) are added, this ratio will be higher than that reported for nurses alone.

3. The number of other (unskilled) individuals working in the health care system and their average wage relative to the national average. The ratio of the number of these unskilled workers to the number of doctors or skilled workers will vary. If there are many hospital beds, there may be relatively more unskilled workers to provide personal care and housekeeping/maintenance services. Where there are many nurses, they may perform tasks delegated to unskilled nursing assistants in a health system where there are fewer nurses receiving relatively high rates of pay. The number of these workers in the health care system is difficult to obtain on a consistent basis (e.g. is a hospital cafeteria worker in the health care or catering business?).

4. The total expenditure on medicine and supplies. The amount spent on medicine and supplies may be expressed as a detailed accounting of the price and volume of each type of supply and drug and purchased in a given year. It may also be useful to express per capita drug and supplies expenditures as a percentage of the national average wage, because drug prices are partially determined by the international market, so a given package of drugs will cost a higher multiple of a worker's salary in a low wage country.

5. The capital term reflects total annual investment in equipment and facilities and may be expressed as a proportion of the value of the existing capital stock in the health sector plus the costs of using the capital, such as utilities, minor repairs, etc. The amount needed for capital will depend on the extent of the health facility network, the effort with which it has been maintained, and the incentives for new technologies which are implied in the budgeting or reimbursement system. As the British experience discussed below indicates, a long period in which little was invested in facilities may be followed by a period of increased investment in which facilities are modernized, expanded or replaced. Although there is variation in this term, approximations can be made of the proportion of annual health care expenditure which must go into capital investment.

Can a formula such as Equations (1) through (4) provide any help in anticipating the "necessary" cost of a health care system? Countries do not use such formulas to determine the level of funding to allocate to the health care sector, with the exception of some budget formation processes inherited from the former Soviet public financing system based on normatives and "medical economic standards." It is possible, however, to carry out simulations using these equations, for example, to compute an approximate necessary level of health expenditure as a proportion of GDP by replacing actual levels of some variables with "desired" levels. Such simulations may provide insight into how much expenditure might be needed to bring the health care systems of the Central Asian republics closer to international standards.

For example, although it is not possible to apply the average wage rates of doctors, nurses or even unskilled health care workers from a developed country to the Central Asian republics, it is possible to index wages of different staff categories to the prevailing wage level in the country by stating the average wage as a multiple of the average per capita GDP. Thus, if the typical physician were to earn $94,000 per year in the United Kingdom, where the per capita GDP is $24,219, then the physician's salary level is approximately four times the per capita GDP. Expenditure (per capita) on physicians will then be the average physician salary (four times per capita GDP) divided by the number of persons per physician (617), or $152. Similar calculations can be made for other professional staff and non-professional health staff if one knows (or assumes) the ratio of average salary in the category to per capita GDP and the number of workers in the category compared to the number of doctors. To simulate the funding implications of bringing Central Asian physicians closer to international standards of relative salary levels, the wage multiplier in equation (4) can be increased to, for example, 2.5 times the average per capita GDP.

The "medicines and supplies" term of the equation can be quantified in two ways. One can assume that a properly functioning health system must provide the same amount per capita for drugs and supplies as other systems at similar levels of development. Wealthier countries provide a wider array of new drugs and supplies, often expensive and still on patent. Thus, it is hard to extract the "necessary" cost of drugs from experience at other levels of development. It is also true that no country can get good health care if it does not provide essential drugs. Thus, we might take the average of per capita drug expenditures in Thailand, Mexico, Brazil, Turkey and China and indicate this as the amount that needs to be spent in a Central Asian Republic with a literate population and a demographic and epidemiological profile similar to these newly industrializing countries.

$$S = d*N \qquad (5)$$

Where,

d   =   per capita expenditure on drugs/supplies

N   =   population

Another way of valuing the drugs/supplies term of the equation is to look at the proportion of national health expenditure which is allocated to drugs/supplies. In Britain, this was 16.7 percent. For developed countries, the range in the proportion of health expenditure spent on drugs/supplies is nine percent to 21 percent. In Kyrgyzstan, 12.4 percent of government health expenditures were allocated to drugs/supplies in 2001, but it is expected that the percentage of total health expenditures is actually significantly higher, because most drugs are paid for out-of-pocket by individuals. The UK seems to be right in line with this pattern, so we will use the assumption that 17 percent of total health expenditure must be spent on drugs and supplies in a country at this level of development.

Finally, we need a capital term in the equation. Reported capital investment varies from a low of 1.6 percent of total expenditure to a high of 10 percent of total annual health care spending. Kyrgyzstan allocated about eight percent of public health expenditures to capital in 2001. Countries that have held back capital expenditure (like the UK) now find that they need to increase this expenditure. Britain already reported 4.4 percent of health expenditure going to capital investment before the recently announced

increase in health sector spending and investment. Therefore, it is assumed that capital expenditure equal to 5 percent of annual health expenditure would be a reasonable allocation.

The cost of using the capital, or the cost of utilities, is much higher as a percentage of total costs in the Central Asian republics than in other countries. The deregulation of utilities combined with the inefficient delivery systems for heat and water and excessively spacious health care facilities has led to utility costs that consumed an additional 15 percent of government health care expenditures in Kyrgyzstan in 1998.[13] Therefore, the high cost of utilities must be included in the estimate of the cost of operating the current health care delivery system for Central Asian countries.

We can then quantify this formula in per capita terms for the U.K., if we make the following assumptions:

- Per capita GDP is $24,219 in current $U.S., which is reported by the World Bank World Development Indicators (2001). [*]

- There are 162 physicians per 100,000 population

- Doctors are paid on average four times per capita GDP

- There are four times as many nurses and paraprofessionals as physicians

- Nurses and paraprofessionals are paid twice the per capita GDP

- There are 12 times as many unskilled health care workers as doctors

- Unskilled health care workers are paid the average per capita GDP

- Per capita drug expenditure is $301 per year, which is 17 percent of actual annual per capita health expenditure, the allocation to drugs actually observed in the U.K.

- Capital expenditure is $88 per person per year, which is five percent of actual annual per capita health expenditure, the allocation to capital actually observed in the U.K.

Total per capita cost = .X (per capita GDP) =

$$\alpha_1 \alpha_2 (W)(N) + \alpha_2 \alpha_3 \alpha_4 (W)(N) + \alpha_2 \alpha_5 \alpha_6 (W)(N) + K + S \qquad (6)$$

Total per capita cost = .X ($24,219) =

$$\left(\frac{162}{100,000}\right)(4)(\$24,219) + \left(\frac{162}{100,000}\right)(4)(2)(\$24,219) + \left(\frac{162}{100,000}\right)(12)(1)(\$24,219) + \$301 + \$88$$

$$\text{Total per capita cost} = \$1,331$$
$$X = 5.5\%$$

The result of these assumptions is a total health system cost equal to $1,331, or about 5.5 percent of GDP. This estimate is less than the actual spending level of 7.5 perccent of GDP. The equation clearly fails to capture some costs of health care operations, such as maintenance contracts, utilities, and the purchase of food stuffs. The average salary estimates may also be too low. But this calculation sets a lower bound for a

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[*] For these simulations, current per capita GDP in $U.S. is used rather than GDP in terms of purchasing parity, which was reported in Section 3.

health care system to operate with this complement of staff, the assumed salary ratios, and the same level of commitment to drugs and capital expenditure that is currently observed.

Next we apply this formula to Kazakhstan making the following assumptions:

- Per capita GDP is $1,503 in current $U.S., which is reported by the World Bank World Development Indicators (2001).

- There are 353 physicians per 100,000 population

- Doctors are paid on average 2.5 times per capita GDP. This assumes a substantial increase in the current salary level for physicians, which would be necessary to bring physicians in Kazakhstan closer to international standards of relative salary levels, increase productivity, and reduce under-the-table payments.

- Compared to Britain, there are more doctors and relatively fewer paraprofessionals and unskilled workers in the former Soviet countries. There are 1.8 times as many nurses as doctors in Kazakhstan, so we will assume that there are three times as many nurses and paraprofessionals as physicians.

- Nurses and paraprofessionals are paid 1.5 the per capita GDP.

- We will assume there are only twice as many unskilled workers as doctors and paraprofessionals combined. This is consistent with reported data from Russia in 2000, when total health system employment (4,454,000) was about eight times the number of employed physicians (529,000).[11]

- Unskilled health care workers are paid the average per capita GDP.

- Per capita drug expenditure is $9.50 per year, which is 17 percent of actual annual per capita health expenditure.

- Capital expenditure is $3 per person per year, which is five percent of actual annual per capita health expenditures.

- We will also include expenditures on utilities, which according to recent public expenditure reviews are estimated to be about 20 percent of actual per capita health expenditures, or $11 per capita.

Total per capita cost = .X ($5,871) =

$$\left(\frac{353}{100,000}\right)(2.5)(\$1,503)+\left(\frac{353}{100,000}\right)(3)(1.5)(\$1,503)+$$

$$(2)\left[\left(\frac{353}{100,000}\right)(\$1,503)+(3)\left(\frac{353}{100,000}\right)(\$1,503)\right]+\$9.5+\$3+\$11$$

$$=\$103$$

$$=6.9\% \text{ of per capita GDP}$$

Using the formula, total health care spending must be $103 per capita, or 6.9 percent of GDP in order to achieve relative salary levels and expenditures on drugs and supplies that are closer to international standards. Reported public spending on health in Kazakhstan is only about 2.7 of GDP, excluding out-of-pocket expenditure. Furthermore, the assumed per capita drug expenditure may still be below the expenditure required for access to necessary drugs. If per capita drug expenditures were increased to six percent of the level in the U.K. (Kazakhstan's per capita GDP is six percent of the U.K.'s per capita GDP), drug expenditures would be $18 per person. Total per capita health expenditures would have to increase to $112, or 7.4 percent of per capita GDP.

It is easy to see from this calculation that the health system must "earn" the necessary money from private sources if the existing number of workers are to receive compensation at the levels indicated while maintaining the large labor force and high utility costs associated with the extensive network of health facilities. To hold down health expenditures in the 1990s, budget makers have limited salaries and cut drug and capital expenditures below the indicated levels. The population has made up most of the "missing" drug expenditures through private purchases, often at high prices. The existing extensive hospital network has not been maintained, and salaries have not been paid at adequate levels. With salaries below the targets that they consider desirable or necessary for a given life style, doctors and nurses have found ways to supplement their salaries, through informal payments from patients or from supplementary work outside of the health care system.

This result can be viewed in two ways. It shows the minimum amount of public funding required (6.9 percent of GDP) if a health care system of the current size is to be "free" and workers paid at the levels indicated. Or, the model can be used to determine what multiples of the average wage might be payable to health care staff if the number of staff is cut and the amount of GDP committed to health care is increased, but not to the level of nearly seven percent.

IX. How Nations Decide: The Process of Determining National Health Expenditure

The determination of total national health expenditure is a complex process. It combines history and aspiration, economic capacity and medical need, and pits a variety of opposing political interests. Health care workers want higher salaries, while employers want lower taxes and benefit contributions. While the size of the health care system is one factor in determining a country's level of health expenditure, no nation relies solely on formulas tied to health system staffing or capacity to determine total national health funding.

Over the past twenty years, most developed nations have generally focused on *limiting* the growth in health care spending. In different ways, Canada, the United States, Germany and France have all attempted to slow the tendency of health expenditure to consume a larger percentage of GDP. But not every country has focused at the national level on decreasing health expenditures. The United Kingdom (see box) has embarked on a deliberate program to *increase* the proportion of GDP spent on health care. It is instructive also to briefly review recent experience in Germany, Canada and the Untied States in setting health care funding levels.

Over the last twenty years, the United States saw two significant shifts in health policy designed to reduce health expenditures. First, the largest publicly funded health insurance program (Medicare), serving the elderly and disabled, changed its provider reimbursement policies to influence provider behavior. The Diagnosis Related Group (DRG) system for reimbursing hospitals definitely reduced hospital length of stay and total inpatient utilization, although total benefit costs continued to grow with inflation and the increase in the number of elderly program beneficiaries. In the year DRGs were introduced (1984), the average length of hospital stay for Medicare beneficiaries fell by 1.6 days and remained 13 percent below baseline levels four years later. Although the payment per inpatient case increased, the admission rate for Medicare patients fell 14 percent over the four years after the introduction of DRGs. In the four years before the DRG system was introduced, total Medicare costs grew by 52 percent, after adjustment for inflation. In the four years after DRGs, the post-inflation increase in total costs fell to 19 percent.[12] Heartened by this improvement, the government introduced a new system for reimbursing physicians, replacing a system in which physicians determined their own fees, subject to a complicated price capping mechanism. The new Resource Based Relative Value Scale (RBRVS) attempts to increase payments for primary care relative to the previously high payments for procedure-based specialties. As rate reforms cut into the profitability of certain hospitals, changes in capacity have followed. Hospitals were closed and the number of staffed beds reduced. An increasing number of complex procedures are now done on an

outpatient basis. Teaching hospitals began to cut residency programs, and medical schools began to shift emphasis to primary care.

The second major shift in health funding policy occurred almost without government intervention. When the U.S. Congress failed to adopt a national health insurance program in response to President Clinton's 1993 proposal, employers intensified their efforts to hold down health insurance payments. Concerned about international industrial competitiveness, the employers tried to limit total labor costs by slowing the growth of health insurance premiums. This accelerated the growth of "managed care" plans that provide financial incentives to decrease utilization of services and drive down the prices paid to hospital and doctors. For a few years in the mid 1990s, the rate of growth in total health spending slowed. Physician incomes, particularly in some specialties, declined significantly. By 2002, the efficiency incentives from Medicare reimbursement changes and managed care had generally worked through the system, and total health care expenditure is again growing faster than GDP.

Given its diffuse system of health care financing, the United States is the country that would seem least likely to determine health care budgets based on facility or staff-oriented formulas. But more planned and regulated health systems have also attempted to push down total health expenditure using such indirect levers. Health care claims are paid by many different sickness funds in Germany, but they all operate within a comprehensive regulatory regime. As employers experienced higher health insurance premiums, threatening industrial competitiveness, the Government used its policy setting leverage to introduce new techniques that slow cost growth. A "ratchet" was applied to physician fees. If total physician claims exceed a planned amount in a region, the rate of payment for each visit is reduced to stay within the negotiated spending cap. As Schneider notes, "the cost containment policy of the German health care system has been directed mainly toward reducing price inflation, although volume of services is also a concern in the budgeting of health care costs."[13] In effect, the German government set a target to limit health care spending to the share of GDP reached in the early 1980s, and then used both legislative authority and negotiating leverage to achieve this goal. Eventually, these policies will affect capacity. As physician income is restrained, the incentive to enter medical practice is reduced. Hospital utilization has come down too, but much less dramatically than in the United States.

Like Germany, Canada set out to lower its rate of growth in health care spending. Because health care in Canada is funded by taxes, the precipitating factor was an increase in budget deficits. To move closer to balance, the Federal Government cut back on the amount of funding transferred to the provinces, which actually pay health care claims. The Federal Government did not direct the provinces to make changes in the structure of the health care system. Instead, it kept intact the requirements of the Canada Health Act that health care be accessible, comprehensive, universal, portable, and publicly administered (although providers are usually private or non-profit). While Federal funds paid 50 percent of provincial health care costs in 1977, the Federal contribution fell to 20 percent by the late 1990s. As Maslove and Geva-May point out when analyzing this trend, the provinces "assumed more control over the structure of the system" in order to ensure that cuts "were minimally damaging."[14] In fact, more limited funding led to provincial decisions not to fund hospitals, and thus to hospital closure. In Saskatchewan, in 1992 alone, the Province restructured its funding and contracts so that 52 small rural hospitals (out of a total of 134 hospitals in the province), were forced to close or shift to outpatient or nursing home care.[15]

While the evaluation of rural hospital closures in Saskatchewan shows no negative effects on access or health outcomes, the pendulum may be swinging back the other way in terms of national health care funding in Canada.[15] Bed shortages and waiting lists in large cities are a matter of increasing concern. Programs with an element of managed care or gate keeping are proposed as provinces attempting to extract still more care out of the available budget.[16] It would not be surprising for Canada to reach a point where, as in the United Kingdom in the late 1990s, the debate swings back to address a need for additional funds – not based on the supply of beds or the number of doctors, but based on the perceived quality and availability of services.

Of course, the countries of Europe do have direct influence over new investment in hospital beds. Governments in these countries generally provide the bulk of funding to build new and replacement hospitals, even where the facility may be run by a non-governmental organization. Population-based standards for beds and other services are used in such exercises. Many countries have a mechanism whereby capital-intensive new diagnostic and treatment facilities require prior approval, so as to constrain the growth in total facility supply. The number of free places in medical schools can also be adjusted to increase or decrease the supply of physicians in the long run. But these actions take place at the margin. The total amount of funding going into the health care system in a year is not determined by these planning standards, although population and facility-based formulas may be used in distributing centrally raised funds between regions or localities. At the highest levels, the funders devise policies, or appropriate budgets, which take existing capacity into account as only one factor in a process. Also important are the trends in expenditure, public perception of the performance of the health care system (see the increase in health funding in Britain), and the political strength of competing recipients of public funds.

Case Study:

GIVING THE NATIONAL HEALTH SERVICE A BIGGER PIECE OF THE PIE

Comparative analyses of health financing systems always laud the National Health Service (NHS) in Great Britain as "efficient" because it obtains a level of system performance consistent with other West European countries while using a lower percentage of the Gross Domestic Product. Total health expenditure in Britain, which is 85 percent public, was only 6.8 percent of GDP in 1997, compared to 10.7 percent in Germany and 9.6 percent in France.[1] Recent political developments make it clear that a continuation of this low level of expenditure is unacceptable to the British public. Queues for specialist consultations and elective hospital admission are long, and a political liability for the party in power. Dissatisfaction with the NHS has grown, although the electorate remains committed to the nationwide availability of comprehensive care with little or no charge to the user. Internal market reforms ("fund holding" general practices and quasi-independent hospital trusts) introduced by the previous Conservative government showed some promise in improving efficiency.[17] However, the reforms failed to cut total waiting lists. Because not all general practitioners were fund holders, the equity principles of the NHS were challenged. After election in 1997, the new Labor Government backed away from this reform while continuing to espouse the merits of an "equitable" internal market.

Looking across the English Channel at Europe, the British see shorter waiting lists, equivalent or better health performance, greater numbers of doctors in relation to the population, and near universal entitlement. These are combined with significantly higher shares of the GDP dedicated to health care. A 1996 poll showed 41 percent of Britons to be dissatisfied with "the way health care is run," compared with 28 percent of Europeans. Over 80 percent of Britons, compared to 48 percent on the Continent, wanted more money spent on the health care system. Only 29 percent of the British respondents were willing to finance higher expenditure with higher taxes or social insurance contributions, but this was almost three times the 11 percent of continental Europeans prepared to contribute more to health budgets.[18]

By the year 2000, the Labour Government adopted a policy to substantially increase public funding of the NHS over the long term. The national budget announced in 2000 proposed to increase annual NHS spending from 50 billion to 70 billion pounds over a four year period; a real increase in Government health spending of over 5 percent per year. The Treasury predicted that this would drive total British health spending up to 7.6 percent of GDP by 2003-2004.[19]

Part of the additional expenditure will go into capital investment – the training of additional doctors and nurses, and the renewal of aged NHS hospitals. Some is already being spent to shorten waiting lists by contracting for surgery at private hospitals, and even in European facilities. Relative compensation levels for doctors and nurses are also expected to increase in order to attract and retain more professionals and raise the ratio of doctors and nurses to population. Although making much of targeted reductions in waiting times for operations and specialist appointments, the policy of higher funding was not tied to specific formulas for expenditure per bed or per patient. Instead, the Government set an explicit target to converge with European norms of health spending, with the expected result that the NHS will deliver greater citizen satisfaction while maintaining equitable access. In November 2001, Prime Minster Tony Blair, in a Parliamentary speech, set a goal of matching the European Union average for health care spending by 2006. The Chancellor of the Exchequer, Gordon Brown, promised that health spending in the period 2003-2006 will receive "a significant higher share of national income."[20] In February 2002, a further $4 billion was added to planned health spending in order to move towards the goal of parity with the European Union average. This spending increase was partially linked to a tax increase.[21]

X. Conclusions

The countries of Central Asia are as literate as the most developed countries, they have only a moderate health care burden created by aging, and health care outcome indicators are roughly comparable to the newly industrialized nations. What they clearly have is far more doctors and more hospital beds than any but a few of the richest countries shown. The Central Asian republics also allocate a lower level of GDP to health care than other countries with similar national income, but this funding must support a much larger health care infrastructure and labor force. The performance of the health care system under such conditions is likely to suffer. The experience of other nations shows that there is no way for the countries of Central Asia to avoid very difficult decisions.

Almost all developed countries aspire to offer essential medical services to the full population without reference to ability to pay. As incomes increase, an increasing proportion of medical care is funded by public sector budgets or social insurance.[22] Even in the United States, the only developed country that does not provide access to medical care for all its citizens, governments pay approximately half of health care costs, with another quarter coming from private risk-pooling mechanisms. It is very difficult for any developed and aging country to offer comprehensive medical services with minimal economic barriers unless it spends at least 6-8 percent of its GDP on health care services, with 75 percent or more of this coming from public funds or other broad-based risk-pooling mechanisms. If out-of-pocket costs for drugs and informal payments are honestly measured, the countries of Central Asia are far from meeting these targets.

To move the level and composition of health funding toward those targets that characterize developed health systems, the Central Asian republics must do one or more of the following:

- Increase the efficiency of the tax collection system (increase the size of the overall budget);

- Allocate a larger percentage of the general budget to health care;

- Downsize the health system to one that can be fairly compensated from existing levels of taxes and mandatory health insurance funds. This means substantially reducing both the size of the health care labor force and the stock of physical facilities, while at the same time upgrading professional skills and increasing efficiency. With fewer employee "mouths to feed" and lower utility bills, public health expenditures can support higher salaries and more adequate allowances for drugs and equipment

- Increase the funding available from publicly supported risk-pooling mechanisms, such as national budgets from general revenues, or a national health insurance fund or mandated health insurance coverage. Such risk-pooling mechanisms could collect additional premiums to offset much of the cost of benefits for employee dependents. This will require employee as well as employer contributions, as is done in Germany. It will also require a more adequate provision to adjust for differences in the ability of local economies to support health care costs; a national equalization fund supported by tax revenue or a substantial portion of collected insurance premiums.

None of these policies will be easy. With current per capita income levels, it is unlikely that any measure will permit coverage of the full range of expensive medical interventions available in wealthier countries. But no national policy concerning the level of health funding can be determined based solely on the existing supply of personnel and facilities. Countries endeavoring to restrain the growth of health spending (Canada, Germany, US) have not done so by tinkering with individual facility budgets. Instead, they have attempted to set targets and develop policy levers to achieve the desired change in funding trends. Even in the United Kingdom, which has decided to *increase* the public funding of health care, total expenditure targets have been set nationally, with the health system then tasked to use the increased funding in the most efficient way. These processes reflect a clear specification of the roles and relationships in the health sector. At the macro level, policies are enacted to influence the level and

formation of the health care budget. The micro-level allocation of funds to individual health care facilities, or provider payment, is a separate function that takes the level of funding in the system as a given. As shown in this review, countries worldwide ultimately make political decisions about the level of government resources to allocate to health care, political decisions that reflect the value the government and society place on health relative to other priorities.

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XI. References

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